Claims

1. A multimodal polymer composition comprising

   a. at least one polymer (A) having a weight average molecular weight (M_w) of lower than 60000 g/mol;

   b. at least one polyolefin (B) having a higher weight average molecular weight (M_w) than polymer (A); and

   c. a filler (C), whereby

   the polymer composition without filler (C) has a density of 940 kg/m^3 or lower.

2. A polymer composition according to claim 1 characterized in that at least one polymer (A) is

   (1) a polyolefin having a weight average molecular weight (M_w) of 10000 to 60000 g/mol, or

   (2) a wax having weight average molecular weight (M_w) of less than 10000 g/mol.

3. A polymer composition according to claim 2 characterized in that the polyolefin (1) is a low density polyethylene (LDPE), a linear low density polyethylene (LLDPE) or a linear medium density polyethylene (LMDPE).

4. A polymer composition according to claim 2 or 3 characterized in that the wax (2) is selected from one or more of

   (2a) a polypropylene wax having weight average molecular weight (M_w) of less than 10000 g/mol or a polypropylene wax having weight average

molecular weight (M_w) of less than 10000 g/mol, or

(2b) an alkyl ketene dimer wax having weight average molecular weight (M_w) of less than 10000 g/mol.

5. A polymer composition according to any one of the preceding claims 2 to 4 characterized in that the composition comprises a polyolefin (1) as polymer (A) and a wax (2) as a further polymer (A).

6. A polymer composition according to any one of the preceding claims 1 to 5 characterized in that the polymer (A) has a density of lower than 945 kg/m^3.

7. A polymer composition according to any one of the preceding claims 1 to 6 characterized in that the multimodal polymer composition is at least a bimodal polymer composition.

8. A polymer composition according to any one of the preceding claims 1 to 7 characterized in that the polyolefin (B) has a weight average molecular weight (M_w) of higher than 80000 g/mol.

9. A polymer composition according to any one of the preceding claims 1 to 8 characterized in that the polyolefin (B) is a polyethylene.

10. A polymer composition according to claim 9 characterized in that the polyolefin (B) is a low density polyethylene (LDPE), a linear low density polyethylene (LLDPE) or linear medium density polyethylene (LMDPE).

11. A polymer composition according to any one of the preceding claims 1 to 10 characterized in that the total polymer composition comprises 1 to 50 wt% of polymer (A), 40 to 90 wt% of polyolefin (B) and 1 to 50 wt% of filler (C).

12. A polymer composition according to any one of the preceding claims 1 to 11 characterized in that the polymer composition without filler (C) has melt flow rate MFR_2, according to ISO 1133, at 190 °C, of 5 to 20 g/10min.

13. A polymer composition according to any one of the preceding claims 1 to 12 characterized in that the polymer composition without filler (C) has melt flow rate MFR_5, according to ISO 1133, at 190 °C, of 20 to 40 g/10min.

14. A polymer composition according to any one of the preceding claims 1 to 13 characterized in that the polymer composition without filler (C) has melt flow ratio MFR_5/MFR_2 of 2.5 to 4.5.

15. A polymer composition according to any one of the preceding claims 1 to 14 characterized in that the polymer composition without filler (C) has a ratio of the weight average molecular weight (M_w) to the number average molecular weight (M_n) from 8 to 25.

16. A polymer composition according to any one of the preceding claims 1 to 15 characterized in that 95 wt% of the filler (C) has a particle size of less than 10 μm.

17. A polymer composition according to any one of the preceding claims 1 to 16 characterized in that the filler (C) is talc.

18. A polymer composition according to any one of the preceding claims 1 to 17 characterized in that the polymer composition comprises additionally antioxidants(s) and/or process stabilizers of less than 2000 ppm in the total composition.

19. A polymer composition according to any one of the preceding claims 1 to 18 characterized in that the polymer composition is a linear low density polyethylene (LLDPE) or a liner medium density polyethylene (LMDPE), whereby polymer (A) and polyolefin (B) are produced in a multi step polymerization process.

20. A polymer composition according to claim 19 characterized in that the amount of comonomer units in a linear low density polyethylene (LLDPE) or a in liner medium density polyethylene (LMDPE) is 0.1 to 1.0 mol %.

21. A polymer composition according to claim 19 or 20 characterized in that the polymer (A) and the polyolefin (B) is a linear low density polyethylene (LLDPE) or a liner medium density polyethylene (LMDPE), whereby the comonomer units are selected from the group consisting of C_3 α-olefin, C_4 α-olefin, C_5 α-olefin, C_6 α-olefin, C_7 α-olefin, C_8 α-olefin, C_9 α-olefin, C_{10} α-olefin, C_{11} α-olefin, C_{12} α-olefin, C_{13} α-olefin, C_{14} α-olefin, C_{15} α-olefin, C_{16} α-olefin, C_{17} α-olefin, C_{18} α-olefin, C_{19} α-olefin and C_{20} α-olefin.

22. A polymer composition according to any one of the preceding claims 1 to 18 characterized in that the polymer (A) is a wax (2) according to claim (4) and the polyolefin (B) is a linear low density polyethylene (LLDPE) or low density polyethylene (LDPE).

23. A polymer composition according to claim 22 characterized in that the polymer composition comprises additionally a polyolefin (1) being a linear low density polyethylene (LLDPE) as a further polymer (A).

24. A polymer composition according to claim 20 or 21 characterized in that the polymer composition is a linear low density polyethylene (LLDPE) whereby polyolefin (1) (polymer (A)) being a linear low density polyethylene (LLDPE) is the lower molecular weight fraction of LLDPE and polyolefin (B) being a linear low density polyethylene (LLDPE) is the higher molecular weight fraction of the LLDPE.

25. A polymer composition according to claim 24 characterized in that the polymer (A) and polyolefin (B) are a mechanical blend, preferably an in-situ blend produced in a multistage polymerization process.

26. A multi-layer material comprising

a. a substrate as a first layer (I)

b. a multimodal polymer composition according to any one of the preceding claims as at least a further layer (II).

27. A multi-layer material according to claim 26 characterized in that the substrate is selected from the group consisting of paper, paperboard, aluminium film and plastic film.

28. A multi-layer material according to claim 26 or 27 characterized in that the multi-layer material comprises as a further layer (III) comprising a low density polyethylene (LDPE).

29. A multi-layer material according to any one of the preceding claims 26 to 28 characterized in that the low density polyethylene (LDPE) layer (III) has a melt flow rate MFR_2, according to ISO 1133, at 190°C, of at least 5 g/10 min.

30. A film comprising a multimodal polymer composition according to any one of the preceding claims 1 to 25.

31. A process for producing a composition according to any one of the preceding claims 1 to 25 characterized in that

a. polymer (A) and polyolefin (B) are produced together in a multistage process comprising a loop reactor and a gas phase reactor, wherein polymer (A) is generated in at least one loop reactor and the polyolefin (B) is generated in a gas phase reactor; and

b. filler (C) and the composition comprising polymer (A) and polyolefin (B) are blended together and compounded.

32. A process for producing a composition according to claim 31 characterized in that the catalyst used for the process producing the composition comprising polymer (A) and polyolefin (B) is a high activity procatalyst comprising a particulate inorganic support, a chlorine compound deposited on the support, wherein the chlorine compound is the same as or different from the titanium compound, whereby

the inorganic support is contacted with an alkyl metal chloride which is

soluble in non-polar hydrocarbon solvents, and has the formula $R_nMECL_{3-n})_m$ wherein R is a C_1-C_{20} alkyl group, Me is a metal of group III(13) of the periodic table, n=1 or 2 and m=1 or 2, to give a first reaction product, and

the first reaction product is contacted with a compound containing hydrocarbyl and hydrocarbyl oxide linked to magnesium which is soluble in non-polar hydrocarbon solvents, to give a second reaction product, and

the first reaction product is contacted with a compound containing hydrocarbyl and hydrocarbyl oxide linked to magnesium which is soluble in non-polar hydrocarbon solvents, to give a second reaction product, and

the second reaction product is contacted with a titanium compound which contains chlorine, having the formula $Cl_xTi(OR^{IV})_{4-x}$ wherein R^{IV} is a C_2-C_{20} hydrocarbyl group and x is 3 or 4, to give the procatalyst.

33. A process for producing a multi-layer material according to any one of the claims 26 to 29 characterized in that the multimodal polymer composition according to any one of the claims 1 to 25 is applied on the substrate by a film coating line comprising an unwind, a wind, a chill roll and a coating die.

34. Use of the multimodal polymer composition according to any one of the claims 1 to 25 for extrusion coating.

35. Use according to claim 34 characterized in that the polymer extrusion composition according to any one of the claims 1 to 25 is used for extrusion coating producing a multi-layer material according to any one of the claim 26 to 29.

36. Use of the multimodal polymer composition according to any one of the claims 1 to 25 for a film, preferably for a cast film.